

Chapter IV

RESEARCH, DEVELOPMENT, AND PROCUREMENT

During the 1950s, research and development efforts and the resulting procurement programs had a major impact on the Army Aviation Program. The fixed wing aircraft industry was well established and had an extensive research and development background. The Army therefore was able to rely principally on user tests and modifications of commercial types to meet its requirements. Helicopters, however, were still in a relatively primitive state of development and lacked a significant civilian market. For this reason, helicopter development, particularly of the larger transport types, was heavily dependent on military sponsorship. Prior to 1952 most of this support had been provided by the Air Force and the Navy. Army financial support to rotary wing development had been limited to convertiplanes, small reconnaissance helicopters, and certain power plant and supporting research projects. With the rapid expansion of requirements during the Korean conflict, the Army had procured the best available helicopters, relying on future developments to provide more suitable types.¹

Early Procurement Activities

The 5-year period between the end of World War II and the beginning of the war in Korea was a time of recession for Army aviation. The number of aircraft organic to the Army dwindled considerably by 1948 and many of those aircraft which remained were obsolete. Plans to completely replace the L-4 and the L-5 with the L-16 and the L-17 liaison aircraft were held in abeyance and a number of the obsolete aircraft were stored at Fort Sill and not declared surplus to the needs of the Army in view of possible future requirements.

At the beginning of the war in Korea, the Army had over 500 2-place fixed wing aircraft, 143 multiple passenger fixed wing aircraft, and 57 utility helicopters; by the end of the first year of the war the overall strength of the Army's air arm had increased by one-fourth. The most notable expansion occurred with the introduction of the utility helicopter. The growth in the number of Army aircraft is as follows:²

TYPE	6/50	6/51	6/52	12/52
Two-place fixed wing	525	843	1451	1534
Multi-passenger fixed wing	143	165	271	320
Utility helicopter	57	86	320	647
Cargo Helicopter	0	0	1	72
TOTAL	725	1094	2043	2573

Only 481 aircraft had been procured by the Army in fiscal years 1949 and 1950, but with the outbreak of the war in Korea, a sharp rise occurred in the number and type of aircraft ordered by the Army. A total of 3,637 aircraft were ordered in fiscal year 1951, and 702 were ordered in fiscal year 1952. Most were modified commercial, fixed wing aircraft and small reconnaissance utility helicopters. A limited number of H-19 and H-21 helicopters also had been ordered under the experimental helicopter program. A need for a fleet of large and more complex cargo helicopters under the twelve battalion program resulted in the Transportation Corps developing a long range production program that could be readily modified to meet budgetary limitations, difficulties, and the impact of the cargo helicopter requirement. By November 1952, the Transportation Corps had drawn up a 5-year program, covering both fixed and rotary wing aircraft. Production schedules had to be spread over a number of years because of limited production capability and cost. The total aircraft budget had to be kept within prescribed expenditure ceilings. The relative inexperience in helicopter design and production impeded efforts to attain simplification and standardization.

Information regarding the major types of fixed wing and rotary wing aircraft acquired by the Army from 1942 to 1962 is shown in Tables 1 and 2.

Army Observation Aircraft

The Army realized by 1949 that the L-5 and the L-16, cheap, interim aircraft which were never considered satisfactory, were becoming uneconomical to continue in operation. The L-18, although unsuitable for extensive combat, was satisfactorily used as a training aircraft after being rented on a limited basis from Piper Aircraft Corporation. OCAFF in January 1951 recommended the purchase of 120 L-18s for use at the Artillery School as training aircraft. The Department of the Army approved the recommendation of Army Field Forces and announced that delivery of the L-18s was scheduled for May 1951. The aircraft never proved completely satisfactory and were sold to Turkey or turned over to Army flying clubs.

In order to select an adequate replacement for those obsolete aircraft from commercial sources, the Army held a competition among commercial aircraft during the period of April through June 1950. As a result of the competition, the Cessna Model 305 was chosen and was subsequently designated the L-19. The Cessna entry in the competition actually exceeded the specifications set forth for the new observation aircraft. The L-19 was powered by a 213 horsepower Continental engine which provided performance superior to any of the other entries. Army Field Forces Board No. 1 received one L-19 in December 1950 for user tests which would determine whether or not the aircraft would meet the military characteristics for which it was developed, whether or not the aircraft would be suitable for extended use in combat as an observation-reconnaissance aircraft, and what modifications or changes would be incorporated in future production. Also examined were the suitability of the aircraft for use for aerial drop of emergency supplies, aerial wire laying, aerial photography operations in extreme heat and cold, float operations, and use as a trainer. The suitability of its communications and navigation radio equipment was also scrutinized.

Production of the L-19 was scheduled to begin in December 1950, with a rate of 25 to 30 per month for about 15 months. Long range plans called for the L-19 to replace all 2-place airplanes in the Army. The immediate need in Korea and the increased requirements of the Artillery School caused an accelerated L-19 production schedule.

After passing its user tests, the L-19 was utilized successfully in Korea for battlefield observation. The all-around good visibility with a minimum of blind spots and its good maneuverability were the strong points of the aircraft. Battlefield experience did indicate, however, a need for improved short range performance. A higher rate of climb, greater endurance at higher cruising speeds, and higher ratio of useful load to the gross weight also were needed. The L-19 participated in photo reconnaissance despite having unsatisfactory camera mounts, poor stability, and lack of proper sighting devices.³

The last observation type aircraft acquired by the Army during this period was the Piper L-21 Super Cub. This Piper aircraft had been entered in the 1950 competition and had met all of the specifications, but it had been passed over in favor of the superior Cessna L-19. Piper protested this action, with the result that the Army finally did purchase a small quantity of the L-21s. Army Field Forces procured 150 L-21As in 1951 which were mostly utilized as trainers. These were followed by 568 similar L-21Bs which saw extensive service in the Far East. The L-21 was phased out of the inventory in 1953.⁴

Fixed Wing Utility Aircraft

At the outset of the Korean War, the Ryan L-17 was being used extensively for command transportation. However, it lacked the necessary size and adaptability for use in combat. In January 1951, Army Field Forces Board No. 1 conducted a competition at Fort Bragg to choose a multi-place, fixed wing aircraft most suitable to perform utility missions for the Army. As a result of this competition, the Army selected the deHavilland BEAVER for field utility duty and the Beechcraft Twin Bonanza Model 50 for the command mission in higher headquarters. The BEAVER, a rugged aircraft with an exceptionally short takeoff and landing performance and ability to operate from floats and skis, could perform the missions of medical evacuation, resupply, front line photography, and staff transport.

Early in 1951, OCAFF recommended to the Army Field Forces Board No. 1 that it test the deHavilland BEAVER—the XL-20—to determine the degree to which it could satisfy current military characteristics for that type of aircraft which had a capacity of 6 and a cruising speed of 135 miles per hour. The adaptability of the aircraft for extended use by Army units as utility aircraft, its suitability for use in emergency resupply, and its reliability in taking aerial photos and in aerial wire laying also were to be considered.

In order to test it for conditions of extreme heat and cold, one of the XL-20s was assigned to the Desert Testing Center in the summer of 1951 and another was sent to the Arctic Test Branch during the winter of 1951-52. The latter was equipped with a set of wheel skis and floats. The suitability of the communication and navigational radio and adaptability for instrument flying

was tested. The L-20 successfully passed all tests and the Army planned to purchase a large number of the aircraft.

During the spring of 1951, the Air Force held up the procurement program for the L-20 because its 2,800 pounds exceeded the allowable empty weight limit by 300 pounds. The Air Force was rapidly organizing assault helicopter squadrons and was reactivating their liaison squadrons. This produced an unfortunate situation as the Air Force tied up commercial production facilities by duplicating Army contracts. Unless the funds for procurement of Army aircraft were used by 30 June these funds would revert to the Treasury. The Army Field Forces, therefore, requested that procurement of the L-20 by the Air Force be expedited.

The Chief, Army Field Forces, recommended to the Department of the Army in June 1951 that the Department of the Air Force be informed that the Department of the Army had no requirement for support by Air Force liaison squadrons. He also recommended that the Department of the Air Force be told that the Department of the Army proposed to equip its Army aviation sections with suitable airplanes, helicopters, and equipment to perform all liaison missions without qualification as described in previous regulations.

The L-20 was more practicable than the L-19 for evacuation of wounded requiring medical attention enroute to the hospital. When using the L-20, the patients were flown directly from the battlefield to an evacuation hospital rather than to an intermediate stop at a mobile army surgical hospital. However, the L-20 was found difficult to load because of its extremely small doors and the limited maneuvering area inside.⁵

Early in the Korean conflict, the Army Field Forces request for the purchase of four Beechcraft Model 50 airplanes for field testing was turned down by the Assistant Chief of Staff, G-4, Department of the Army, as it did not resolve the question of actual need for an airplane with more than one engine. Army Field Forces Board No. 1 tested several aircraft to replace the L-17 and the LC-126 in January 1951. The outstanding performance of the Beechcraft Model 50 confirmed that it was a superior airplane—one which would be suitable for command liaison transportation at higher staff levels. The very fact that the Beechcraft had two engines made it a safer aircraft, and its capacity of six passengers and crew gave it a distinct advantage over either the L-17 or the LC-126, each with a capacity of four. Because of its short field performance, the Beechcraft was superior to any Air Force or commercial twin-engine plane. The reliability of the aircraft, along with its equipment for instrument flying, permitted rigid scheduling for flight in bad weather. The Army Field Forces stated that Air Force multi-engine aircraft not only lacked the short field characteristics of Army aircraft but were not always available. OCAFF recommended that a requirement for multi-engine aircraft be established and that the Beechcraft Model 50 airplane constitute one-third of all multi-place fixed wing aircraft procured and distributed to corps and higher headquarters. Unreasonable delays developed in the procurement processing of the Beechcraft, as had been the case of the L-20 BEAVER, when the Air Force withheld procurement action because the Beechcraft exceeded the allowable empty weight limit of 2,500 pounds. The first model 50s were purchased in January 1952 and were designated the L-23.

OCAFF planned user tests for fiscal year 1952 which were designed to test twin-engine reliability, single engine performance, suitability for instrument and night flight, and short field performance. In addition, tests would be performed to measure general staff transport flight performance and the suitability of the communication and navigational radio package. Modification or change would be incorporated in future production aircraft and a history of failures, deficiencies, and maintenance difficulties encountered—as well as any other constructive criticism—would be duly noted.

At the request of the Assistant Chief of Staff, G-3, Department of the Army, OCAFF prepared a distribution list for the L-23 aircraft in December 1952 in order that plans could be formulated and school quotas allocated for the necessary multi-engine transition training for the pilots. The LC-126 aircraft with units were reassigned to the Army Aviation School for use in the instrument training program.⁶

Rotary Wing Aircraft

The H-13, SIOUX

The first helicopter used by the Army in Korea was the Bell H-13, which carried a pilot and one passenger and was equipped with two baskets or pods for litter patients. The H-13 was first obtained as the YR-13 in December 1946 and by June 1949 the Army had fifty-nine H-13Bs in its inventory. Shortly after the onset of war in Korea, purchase of twenty H-13s was contemplated by the Department of the Army from uncommitted funds.

In order to meet Far East Command requirements, the Department of the Army had by late November delivered three H-13B helicopters to the Far East. Sixteen H-13Bs were furnished for early shipment to that theater, and ten more were returned from Alaska to the Sixth Army area and were rehabilitated for shipment to FECOM by 14 December. Finally, eight H-13D helicopters were airlifted from the manufacturer to the theater. These H-13s proved to be a real asset in the early days of the war in Korea as a means of medical evacuation.⁷

Development and procurement of the H-13 continued throughout the remainder of the Korean conflict and for many years thereafter. By 30 June 1954, the Army had acquired 790 H-13s of various models. The majority of these were H-13E and H-13G aircraft obtained during 1952 and 1953.⁸

The H-23 RAVEN

A Hiller 360 helicopter was purchased for Army evaluation in 1950 and designated YH-23. Successful trials with this aircraft led to an order for 100 two-seat H-23As in the fiscal year 1951 budget, this being the largest Army contract for helicopters up to that time. The majority of the H-23As were delivered in air ambulance configuration with two external, totally enclosed panniers for stretchers mounted on the fuselage sides. The H-23B followed in 1952 and differed in having a larger engine, a changed undercarriage, and detail refinements. By 30 June 1954, 373 H-23s had been accepted by the Army.⁹

The H-19 CHICKASAW

The H-19C CHICKASAW, which originally served with Military Air Transport Service air rescue squadrons, was obtained by the Army early in 1952. Army Field Forces Board No. 1 tested this aircraft for suitability for medical evacuation, hoisting and rescue work, cargo movement by sling, and suitability for troop transportation. In these user tests the board carefully examined the reliability of the aircraft, considering especially a comparison of hours of maintenance and hours of operation. The board also examined the preferability of Air Force radio equipment in the aircraft rather than existing Army aviation navigational radio equipment. Following successful user tests, the Army obtained ninety-seven H-19s by 30 June 1954. The versatility of these aircraft became evident in Korea, where they were used to transport neutral nations' inspection teams, fly resupply missions for isolated troop units, provide medical evacuation, transport military assistance group personnel and VIP's, and provide transportation for training missions held in coordination with United Nations forces widely dispersed throughout the country. Toward the end of the Korean conflict, two Transportation Corps helicopter companies, the 6th and the 13th, were operational, each with twenty-one H-19 helicopters.¹⁰

Studies prepared in 1954 by Army Field Forces and G-3, Department of the Army, indicated a greater proportionate increase in the requirement for utility helicopters than for any other type aircraft. The Department of the Army urged OCAFF to develop a plan to assure meeting increased requirements at the earliest practicable date with the most suitable aircraft.

Some of the missions of the 800-pound utility helicopter were advanced training of cargo helicopter pilots; special operations of the Transportation Corps, Signal Corps, and Corps of Engineers; aerial movement of casualties; and missions performed by the proposed division, corps, and Army aviation companies as proposed by G-3, Department of the Army. All missions were to be examined to determine the optimum helicopter for each mission. If one type of helicopter was not suitable for all of the missions, could the missions for which the utility helicopter was not suitable be performed by the reconnaissance or light cargo helicopter?

In order to develop a plan for meeting the Army's requirement for utility helicopters, OCAFF would have to analyze the missions planned for the utility helicopter to determine the qualitative requirements for each mission; determine if any changes should be made in the current characteristics of the utility helicopter; determine if the reconnaissance or the light cargo helicopter should be substituted for the utility helicopter in current or planned authorization; compute the phased requirements for utility type helicopters; and determine the extent to which current utility helicopters should be procured against requirements pending development and procurement of a new utility helicopter.

The Department of the Army requested that Army Field Forces make recommendations regarding the ability of any single type utility helicopter to perform all the required missions and whether any changes should be made in the Army Equipment Development Guide. If no single helicopter could perform the required missions, the Department of the Army wanted OCAFF to recommend those helicopters that would be required to perform the missions and also

recommend necessary changes that would have to be made to the Army Equipment Development Guide. The Department also wanted to know if any additional utility helicopters should be procured against present and future requirements.

OCAFF computed utility helicopter requirements for the second half of fiscal year 1955 at 154 increasing to 165 in fiscal year 1956 and 177 in fiscal year 1957. Orders had been placed for 182 H-19 utility helicopters of which 112 had been received, with a balance of 70 to be delivered at 5 per month each in January, February, and March 1955, and 28 in the first and 27 in the second half of calendar year 1956. A review indicated that past and planned procurement of the H-19 was sufficient to meet computed requirements for that aircraft by the first half of fiscal year 1957.

Tables of organization for the new experimental Atomic Field Army (ATFA) organizations provided for a substantial increase in the authorizations of utility helicopters within the field army. Utility helicopters were authorized within the division, in corps and Army aviation companies, and in other units. There were indications that the requirement for this aircraft would expand substantially within the field army during the period 1955-1960, for the performance of missions which would include those of command and staff transportation; liaison and courier; aeromedical evacuation; transportation of small groups of personnel and limited amounts of materiel, supplies, and equipment; and transition instrument training.

OCAFF believed that during the period 1955-1960, the requirement for utility aircraft should be met by both helicopter and fixed wing aircraft. The decision as to whether this requirement should be met by both types of aircraft or by a fixed wing aircraft with a good short field performance, a convertiplane, or other configuration should be based on technical developments and the existing state of the aviation art.

Concerning the procurement of additional helicopters against present and future requirements, OCAFF recommended that proposals be obtained from the Bell Aircraft Corporation relative to production and delivery of a modified H-13 that would incorporate a new engine and a cabin configuration permitting internal carriage of four persons seated and two litter patients. OCAFF further recommended that procurement of the H-19 helicopter be limited to the completion of delivery of the thirty funded for fiscal year 1954 and the fifty-five funded for 1955. The H-19 aircraft of transportation helicopter companies should be taken as a substitute for the H-21 or H-34 and be applied against the utility helicopter requirement as soon as the current shortage of one and one-half ton helicopters would permit.

Finally, OCAFF recommended that, assuming that aircraft selected under the utility helicopter design competition would not become available in quantities until 1959 or 1960, requirements be met by the H-19s then on hand and under procurement, supplemented by later procurement of the modified H-13.¹¹

Development of the Cargo Helicopter

Among the requirements for Army helicopters, Army Field Forces in mid-1951 expressed a need for a helicopter with a payload of 3,400 pounds and a range of 200 miles. In addition to

the H-19, the Army had under procurement the Piasecki H-21, which carried fifteen to twenty passengers. At that time, Army Field Forces ordered the Army Field Forces Board No. 1 to review the requirement for a light cargo helicopter. The H-21 was adopted by the Army, but the first aircraft was not delivered until August 1954. Consequently, plans to equip the 509th Transportation Helicopter Company with H-21s in late 1952 were deferred in favor of the H-25 helicopter which had been procured from the Navy during the year.¹²

It will be recalled that in 1952 the Materiel Requirements Review Panel recommended that there be three sizes of cargo helicopter in the Army: light cargo with a 2,000-4,000 pound payload; medium cargo with a 4,000-8,000 pound payload; and heavy cargo with an 8,000 pound and higher payload. Prior to 1952, the system for processing military characteristics of aircraft through OCAFF and the Department of the Army had been slow, mainly because each organization involved might make changes which required coordination with OCAFF. To reduce to the minimum the time loss incurred in transmission of correspondence, OCAFF already had directed the Senior Army Field Forces Liaison Officer at Wright-Patterson Air Force Base to coordinate informally the military characteristics with the Wright Air Development Center and to submit any comments or recommendations obtained to the Army Field Forces.

Funds were available in fiscal years 1953 and 1954 to initiate development of the Army medium helicopter. In order to accomplish this as soon as possible, OCAFF recommended that after the military characteristics were reviewed that a conference be called by G-3 Research and Development Branch of the Department of the Army prior to 13 October 1952 to consider comments and recommendations received from Wright-Patterson Air Force Base and others. The conference would be empowered to select the agency, if any, to initiate development of the medium cargo helicopter. The military characteristics, as amended, were to be published by the Department of the Army and forwarded, along with fund authorization, to the agency selected as developer with the request that a design competition be initiated to obtain helicopters to satisfy the revised characteristics.

OCAFF commented that the requirement of a ferry range of 750 nautical miles precluded the use of a jet power plant with the accruing advantages of simplicity, producibility, and lower initial cost. It recommended a ferry range of 400 nautical miles be used. OCAFF considered it of the utmost importance that the proposed helicopter be as simple and as inexpensive as possible. The Department of the Army replied in May 1953 that it had reviewed the military characteristics for the Army medium cargo helicopter for applicability to the 3-ton cargo helicopter requirement. The Department of the Army recommended that the review be conducted as part of the overall project then in progress pertaining to military characteristics for all Army aircraft listed in the Army Equipment Development Guide. The department, among its many comments, stated that a requirement for a ferry range of 750 nautical miles was not justifiable in view of the time required to fly this distance and the pilot fatigue which would be involved in extended helicopter flights. A study of the probable needs for ferry range might produce a different figure.

In January 1953, OCAFF directed Army Field Forces Board No. 1 to prepare new military characteristics on all Army aircraft listed in the latest edition of the Army Equipment Development Guide. The board was advised to review past actions for the 3-ton payload helicopter and revise them as needed to reflect any advances in the state of the art or changes in the latest issue of the guide.¹³

Army Field Forces held a conference on 6 November 1953 to review and expedite the military characteristics for the utility and the 5-ton payload helicopters. The conference participants concluded that a requirement existed for a 5-ton payload helicopter for movement of troops and equipment within the combat zone. As envisioned, the helicopter at overload gross weight would have a 7-ton payload capability at full operational radius. It should have facilities and equipment for carrying full passenger and cargo capacity internally, or full cargo capacity externally, and be capable of being quickly converted to carry a maximum number of standard litters. The helicopter would normally be employed in platoon-, company-, or battalion-size units with a capability of operating at night and during instrument flight conditions. The 5-ton payload helicopter would have a mission to transport troops and equipment in the combat zone. The helicopter would have a cruising speed at sea level of 100 knots and an operating radius of 100 nautical miles. It should be able to hover at 6,000 feet and climb at a rate of 1,000 feet per minute. Its single engine service ceiling should be 5,000 feet.

Army Field Forces also established the required armor, armament, protection, and design for the aircraft. Emphasis was to be placed on simplicity of design, mass production, and ease of maintenance. Capability of operating on standard Army fuel and lubricants normally available in the combat zone was desired.¹⁴

In mid-February 1954, the Army Field Forces prepared and submitted proposed military characteristics for a one and one-half ton payload helicopter. This helicopter, which would also be used for the movement of troops, cargo, and equipment within the combat zone, would have facilities and equipment for carrying full passenger or cargo capacity internally or full cargo capacity externally. Capability of quick conversion to carry a maximum number of standard litters also would be provided. These helicopters would normally be employed in platoons, companies, or battalions.

The helicopter envisioned by Army Field Forces would have a payload of 3,000 pounds—not including the pilot and co-pilot. The cruising speed would be 100 knots, and it would have an operating radius of 100 nautical miles. The helicopter could climb at the rate of 1,000 feet per minute and would have safe autorotation in case of power or transmission failure. The center of gravity location and landing gear would be designed to facilitate return to an upright position when, resting or moving on landing surfaces, the vertical axis would be tipped away from the vertical.¹⁵

Army Field Forces in early 1954 also prepared military characteristics for a 3-ton payload helicopter based on those prepared by Army Field Forces Board No. 1 in December 1953. The 3-ton helicopter would be used to move troops and equipment within the combat zone, would normally be employed by platoons, companies, or battalions, and would be capable of operating

at night and in instrument flight conditions. In contrast to the 5-ton helicopter, the 3-ton helicopter would have a gross weight of 6,000 pounds, but would have the same cruising speed of 100 knots and operating radius of 100 nautical miles. All other characteristics were also the same as the 5-ton helicopter, except for the single axle loading which was 5,000 pounds for the 3-ton helicopter in contrast with 6,000 pounds for the 5-ton aircraft.¹⁶

Procurement Planning

The establishment in 1952 of the twelve helicopter battalion program resulted in Transportation Corps plans for equipping the battalions. These plans were integrated into the overall aircraft procurement and production picture. Although the twelve battalion program had been approved in principle in August 1952, the requirement had been based on the estimated production time, rather than on the current troop basis. To facilitate budgetary planning, the Transportation Corps was directed to fit the requirements to the troop basis and to prepare a recommended procurement program. In December 1952, the Transportation Corps presented requirements for 299 light and 614 medium cargo helicopters and a \$670,000,000 program for their procurement from fiscal year 1953 through fiscal year 1957. It recommended procurement of H-21s and H-34s in the first three years and proposed that H-16 and H-37 helicopters be procured in prototype quantities in fiscal year 1954 and in increasing numbers in subsequent years, as production capacity permitted.

The Secretary of the Army approved the proposed Transportation Corps helicopter procurement program in January 1953. Eighty H-34s were ordered in fiscal year 1953. The recommended quantities of cargo helicopters were included in the fiscal year 1954 budget, and the amounts and types for subsequent years were approved for planning purposes.

The Transportation Corps soon developed an ambitious but tentative program calling for the funding of \$736,230,000 over a 5-year period. Most of this sum, about \$684,000,000, was to be spent on cargo helicopters. The remainder would be used to procure reconnaissance helicopters and fixed wing aircraft of the observation, utility, and command types. This program soon required important modifications. Changes in Air Force and Navy procurement planning left the Army as the sole buyer of H-21s and H-16s with fiscal year 1954 funds, and resulted in the Army deferring its production planning for H-16s by one year and providing orders for H-21s to sustain the Piasecki facility until it could begin producing the H-16s. Moreover, fiscal year 1954 funds, initially programed for reconnaissance helicopters, were to be used to procure H-19s which could be used for the utility mission.

The Army Field Forces study of aircraft requirements in the summer of 1953 resulted in a complete revamping of the procurement program. The new 8-year Transportation Corps procurement program, which cost approximately \$1,700,000,000, placed major emphasis on cargo helicopters. Few serious technical problems were anticipated in meeting the requirement for fixed wing or smaller rotary wing aircraft. With the exception of the L-20, which was replacing the obsolete L-17, fixed wing aircraft requirements were being met by assets on hand or previous year funding. Initial procurement was limited to the L-20, and subsequent orders

were delayed until fiscal years 1956 and 1957 in order to take advantage of improvements coming out of the development program. New procurement of reconnaissance helicopters also was held off until fiscal year 1956 to allow for the determination of the suitability of the XH-32 and XH-26. To meet the utility helicopter requirement, the H-19 was procured in fiscal year 1954, and provision was made in the fiscal years 1956 and 1957 budgets for the procurement of a new model.

The Army Field Forces review demonstrated an initial requirement for 475 light, 224 medium, and 214 heavy cargo helicopters. The light cargo needs would be met by previous orders and by additional procurement of H-21s and H-34s. The medium cargo helicopter, the H-37, was scheduled to enter production in calendar year 1955. The heavy cargo helicopter, the H-16, was still in the development stage.

Because of Army Field Forces objections that funds for specific aircraft should not be committed until it had undergone service testing, G-4 directed that action be held up on H-21s and H-34s recommended for fiscal year 1954 procurement. The Transportation Corps protested this action and was supported by the Chief of Staff of the Army who approved the Transportation Corps procurement program for fiscal year 1954 and for subsequent planning. Steps were taken, however, to spread out future spending for reconnaissance and cargo helicopters over the 8-year period to keep within expenditure ceilings.

In the latter part of fiscal year 1954, design difficulties resulted in the cancellation of the fiscal year 1954 order for fifty-six H-21 helicopters. To compensate for this slippage, action was taken to increase the fiscal year 1955 procurement of H-34s by a corresponding number. The procurement of additional H-21s was deferred pending corrective action by the contractor. Delays in approving and committing research and development funds for the H-16 resulted in the phasing back of an additional year of its pre-production financing and initial production.¹⁷

At the close of fiscal year 1954, the H-19 utility helicopters were in short supply, a shortage in part attributable to the need to employ these aircraft as interim cargo helicopters. The Army expected that their release from the cargo mission as new, larger helicopters became available, plus new procurement, would materially ease the shortage by fiscal year 1956. The H-25 had been scheduled for delivery beginning in June 1951. Production difficulties delayed initial deliveries until October 1952. The aircraft proved unsuitable for the utility mission and production was halted in 1953. The H-25s already accepted or on order were used as trainers. Thus, the Army's cargo helicopter requirement was still to be met at the end of fiscal year 1954. All cargo helicopter units were equipped with smaller, interim types of aircraft.¹⁸

Endnotes
Chapter IV

1. Bykofsky, pp. 37-38.
2. McClendon, p. 29.
3. (1) Ltr ATTNG-27 452.1, OCAFF to DA ACofS G-3, 3 Jan 51, subj: Procurement of Liaison Type Aircraft. (2) Annual History, OCAFF 1 Jan-31 Dec 50, pp. 9-10. (3) Ltr ATDEV-7 452.1, OCAFF to AFF Bd No. 1, 1 Mar 51, subj: User Test of L-19 Aircraft. (4) MFR, Personal Experiences of Capt Richard D. Kisling, undated.
4. (1) F.G. Swanborough, *United States Military Aircraft Since 1909* (New York: Putnam, 1963), p. 402. (2) Brig Gen John J. Tolson, "Aircraft Hardware: Aviation Milestones," *Army Aviation*, Feb-Mar 1964, p. 19.
5. (1) Ltr, OCAFF to CofSA, 16 Jul 51, subj: Aircraft Most Suitable to Perform Utility Missions. (2) Ltr ATDEV-7-452.1, OCAFF to Pres AFF Bd No. 1, 1 Mar 51, subj: User Test of L-20 deHavilland BEAVER. (3) DF, ACofS G-3 DA to OCAFF, 11 Apr 51, subj: Procurement of L-20 Aircraft. (4) 1st Ind ATDEV-7 (10 Mar 51), OCAFF to ACofS G3 DA, 5 Jun 51, subj: Operational Suitability Test of L-20 Aircraft. (5) Kisling MFR.
6. (1) DF ATTNG-27, G3 OCAFF to CofS OCAFF, 26 Feb 51, subj: Army Requirements for Command Transportation Aircraft. (2) Ltr, OCAFF to DA ACofS G3, undated, subj: Army Requirements for Command Transportation Aircraft. (3) Ltr, General Mark W. Clark to General J. Lawton Collins, 14 Jul 51, subj: Aircraft Most Suitable to Perform Utility Missions. (4) Memo, OCAFF for DA, 13 Mar 52, subj: User Test of the Beechcraft L-23. (5) Memo, DA ACofS G4 for OCAFF, 23 Dec 52, subj: Distribution Plan for L-23 Aircraft.
7. (1) Tierney and Montgomery, *The Army Aviation Story*, pp. 208-210. (2) Ltr OPS 452.1 (12 Sep 50), ACofS G3 to OCAFF, 12 Sep 50, subj: Procurement of Army Helicopters. (3) Ltr G4 D558521, DA ACofS G4 to DA ACofS G3, subj: Shipment of Helicopters to the Far East Command, 20 Nov 50.
8. (1) Tierney and Montgomery, *The Army Aviation Story*, pp. 256-257. (2) Bykofsky, p. 50.
9. Swanborough, p. 274.
10. (1) Tierney and Montgomery, *The Army Aviation Story*, pp. 213, 249. (2) Memo, ATDEV-7, OCAFF to AFF Bd No. 1, 13 Feb 52, subj: User Test of the H-19C (Sikorsky) Helicopter. (3) Swanborough, pp. 432-433.
11. Ltr G3 452, DA ACofS G-3 to CAFF, 8 Oct 54, subj: Requirement for Utility Type Helicopters, with 1st Ind.
12. (1) Memo ATDEV-7, OCAFF for AFF Board No. 1, 25 Jun 51, subj: Military Characteristics for an Army Light Cargo Helicopter. (2) Memo, CAFF for Chief of Transportation, 21 Nov 52, subj: Assignment of Aircraft to the 509th Transportation Helicopter Co.
13. Ltrs ATDEV-7452.1/83 (C), OCAFF to DA, 19 Sep 52, subj: Military Characteristics for an Army Medium Cargo Helicopter, with 1st Ind, G-3 452 (19 Sep 52), DA G-3 to OCAFF, 20 May 53, same subj, and 2nd Ind ATDEV-7452 (C) (19 Sep 52), CAFF to President, AFF Board No. 1, 11 Jun 53, same subj.
14. Ltr ATDEV-7452.1/426 (24 Nov 53), OCAFF to DA ACofS G-3, 24 Nov 53, subj: Military Characteristics for a 5-ton Helicopter.
15. Ltr ATDEV-7452.1/2 (C) (18 Feb 54), CAFF to DA ACofS G-3, 18 Feb 54, subj: Military Characteristics of a One and One-Half Ton Payload Helicopter.
16. Ltr ATDEV 452.1/1 (21 Jan 54), CAFF to DA ACofS G-3, 21 Jan 54, subj: Military Characteristics for a 3-ton Helicopter.
17. (1) Bykofsky, pp. 50-57. (2) Ltr ATSWC-G 452.1 (C), CAFF to DA ACofS G-3, 14 Jul 54, subj: Procurement of Light Cargo Aircraft.
18. Bykofsky, p. 59.